Massachusetts Department of ENVIRONMENTAL PROTECTION

c a s e s t u d y

Construction and Demolition Waste Reduction

This case study is one in a series developed by Massachusetts Department of Environmental Protection (DEP) to highlight techniques for saving money and protecting the environment through reuse and recycling of construction and demolition debris.

Project Description: Douglas School, Douglas, Massachusetts

Consigli Construction Inc. was the lead contractor for the Douglas School project. The brick structure is located on a wooded hillside in a rural area. While a small portion of Consigli's work on the project was renovation and addition, most of the project consisted of construction of a new high school -- a two-story building designed for 700 students, grades 7-12.

Photo: Blind Dog Photo

Recycling saved almost $32,000

Spotlight: Gypsum Wallboard

Consigli used a combination of contract requirements, a worksite management plan and techniques to require its subcontractors to source-separate approximately 50 tons of clean new scrap gypsum wallboard from construction debris. Placing recycling containers throughout the construction site and putting disposal containers at a distance increased source separation by making it more convenient for workers to recycle than to discard recyclable materials. Workers collected the materials on a regular basis and kept the wallboard dry and stacked flat in a closed container. Consigli transported the scrap wallboard 100 miles to G-P Gypsum Corporation in Newington, New Hampshire. G-P accepts both interior and exterior clean new scrap gypsum wallboard for $11-12 per ton and makes it into new wallboard (the price below reflects the addition of transportation costs).

Cost Savings

Following is a breakdown of the cost savings due to source separation and recycling:

Material	Tons	Recycling Cost	Avoided Disposal Cost*	Savings
Concrete	285	$8,265	$31,065	**$22,800**
Metal	69	$1,380	$7,521	**$6,141**
Wallboard	49	$2,559	$5,450	**$2,891**
Cardboard	0.67	$67	$70	**$3**
Wood	40	$4,381	$4,358	**(-$23)**
TOTALS	**443.67**	**$16,652**	**$48,464**	**$31,812**

**Cost that would have been paid if material was disposed.*

Disposal costs based on local rates in 2003.

Summary

Cost Savings:
- **$31,812**
- **75%**

Project:
Commercial New construction (137,000 square feet)
Renovation and addition (6,800 sq. ft.)

Total Waste Reduction: 57%
- 444 tons reused/ recycled: concrete, metal, wallboard, cardboard and wood
- 338 tons disposed

Contract:
$20.4 million
Lump Sum
Public owner

Work Site:
Rural

Completion:
August 2003

Keys to Success: Oversight of Recycling

Contracting.

- Tie the subcontract language to a waste management plan that requires recycling, specifies recycling techniques, and provides incentives for recycling.

- Negotiate disposal fees by type of material to reduce costs based on the market value of the material rather than paying a flat fee for all materials.

- Verify that recyclable materials are brought to a recycler by requiring that the subcontractor provide "weight slips" from a recycling facility.

Planning. Develop and distribute a waste management plan prior to project initiation. Discuss waste handling requirements with crew and subcontractors before beginning a project and continue to emphasize their importance as work progresses.

Construction. Monitor the recycling bins to prevent cross contamination. Post lists of what is and is not recyclable on the containers.

- Place smaller recycling containers closer to the workers and aggregate materials in a common recycling and disposal storage area.

- Under the management plan, a foreman monitors the recycling and disposal activity for each trade.

Post Construction. Conduct a cost-benefit analysis of recycling to evaluate savings.

- Evaluate the impact of recycling on job safety and scheduling milestones. Consigli found that the waste reduction planning process made for a cleaner and safer site. A more intensive focus on scheduling recycling and disposal hauling created greater efficiencies.

Project Team

- **Building Owner**
  Town of Douglas, Davis Street, Douglas, MA 01516

- **Contractor**
  Consigli Construction Inc.,197 Main Street, Milford, MA 01757, Telephone: (508) 473-2580
  Contacts: Michael Winters, Project Manager, and Michael Codianne, Superintendent

- **Recycling Consultant**
  greenGoat, P.O. Box 441911, Somerville, MA 02144, Telephone: (617) 666-5253
  Contact: Amy Bauman, President

Additional Resources:

- Massachusetts Department of Environmental Protection (DEP) Web site on Construction and Demolition Materials: Reuse and recycling resources for building and demolition contractors includes case studies, model specifications, recycling companies and information on best practices.
  http://www.state.ma.us/dep/recycle/recycle.htm

Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108-4746

Commonwealth of Massachusetts
Mitt Romney, Governor

Executive Office of Environmental Affairs
Ellen Roy Herzfelder, Secretary

Department of Environmental Protection
Robert W. Golledge Jr., Commissioner

Produced by the Bureau of Waste Prevention, August 2003.
Printed on recycled paper.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.